Access DB# 116401

# SEARCH REQUEST FORM

**Scientific and Technical Information Center**

10/631,993

Requester's Full Name: Dwayne Bost Examiner #: 68951 Date: 3/9/04
Art Unit: 2612 Phone Number 30 Serial Number: 10/629,303
Mail Box and Bldg/Room Location: PK2 8A3 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

***For Sequence Searches Only** Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

US 6421464



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| STAFF USE ONLY | Type of Search | | Vendors and cost where applicable | |
|---|---|---|---|---|
| Searcher: KEJ | NA Sequence (#) | | STN | |
| Searcher Phone #: | AA Sequence (#) | | Dialog | |
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| Date Completed: | Litigation | X | Lexis/Nexis | |
| Searcher Prep & Review Time: | Fulltext | | Sequence Systems | |
| Clerical Prep Time: | Patent Family | | WWW/Internet | |
| Online Time: 25 | Other | | Other (specify) | |

PTO-1590 (8-01)

Query/Command : prt max legalall

*1 / 1 PLUSPAT - ©QUESTEL-ORBIT - image*

**PN** - US6421464 B1 20020716 [US6421464]

**TI** - (B1) Fast lapped image transforms using lifting steps

**PA** - (B1) FASTVDO LLC (US)

**PA0** - FastVDO LLC, Columbia MD [US]

**IN** - (B1) TRAN TRAC D (US); TOPIWALA PANKAJ (US)

**AP** - US21221098 19981216 [1998US-0212210]

**PR** - US21221098 19981216 [1998US-0212210]

**IC** - (B1) G06K-009/36

**PCL** - ORIGINAL (O) : 382232000

**DT** - Basic

**CT** - US5081645; US5339265; US5592569; US5604824; US5764698; US5805739; US5812219; US5857036; US5859788; US5883981; US5898798; US5901251; US5903669; US5946038; US5960123; US5973755; US5995668; US5999656; US6018753; US6144771; US6094631; US6104982; US6144773; US6198412
Liang et al., "ITO-Telecommunications Standardization Sector", A 16-bit architecture fo H.26L treating DCT Transforms and quantization, pp. 1-12, May 29, 2001.*

Sweldens, Wim, "The Lifting Scheme: A custom design construction of biorthogonal wavelets", pp. 1-29, Nov. 1994.*

Nayebi et al., "A time domain view of filter banks and wavelets", Signals, Systems and Computers, 1991. 1991 Conference Record of the Twenty-Fifth Asilomar Conference on, 1991, pp. 736-740 vol. 2.

**STG** - (B1) U.S. Patent (no pre-grant pub.) after Jan. 2, 2001

**AB** - This invention introduces a class of multi-band linear phase lapped biorthogonal transforms with fast, VLSI-friendly implementations via lifting steps called the LiftLT. The transform is based on a lattice structure which robustly enforces both linear phase and perfect reconstruction properties. The lattice coefficients are parameterized as a series of lifting steps, providing fast, efficient in-place computation of the transform coefficients as well as the ability to map integers to integers. Our main motivation of the new transform is its application in image and video coding. Comparing to the popular 8 * 8 DCT, the 8 * 16 LiftLT only requires 1 more multiplication, 22 more additions, and 6 more shifting operations. However, image coding examples show that the LiftLT is far superior to the DCT in both objective and subjective coding performance. Thanks to properly designed overlapping basis functions, the LiftLT can completely eliminate annoying blocking artifacts. In fact, the novel LiftLT's coding performance consistently surpasses that of the much more complex 9/7-tap biorthogonal wavelet with floating-point coefficients. More importantly, our transform's block-based nature facilitates one-pass sequential block coding, region-of-interest coding/decoding as well as parallel processing.

**UP** - 2002-29

*1/1 CRXX - ©CLAIMS/RRX*

**PN** - 6,421,464 A 20020716 [US6421464]

**PA** - FastVDO LLC

**ACT** - 20030731 REASSIGNED
ASSIGNMENT OF ASSIGNORS INTEREST

Assignor: FAST VIDEO LLC DATE SIGNED: 07/29/2003

Assignee: FASTVDO LLC 7150 RIVERWOOD DRIVE COLUMBIA MARYLAND 21046-1245

Reel 013835/Frame 0800

Contact: BURNS & LEVINSON LLP FREDERICK C. WILLIAMS 1030 15TH STREET, N.W. SUITE 300 WASHINGTON, DC 20005-1501

LEVEL 1 - 1 OF 1 PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

6421464

<=6> Get Drawing Sheet 1 of 6

July 16, 2002

# Fast lapped image transforms using lifting steps

APPL-NO: 212210 (09)

FILED-DATE: December 16, 1998

GRANTED-DATE: July 16, 2002

CORE TERMS: transform, lifting, liftlt, coding, lapped, fast, coefficient, channel, wavelet, processing ...

6,421,464 OR 6421464

LEXIS-NEXIS
Library: PATENT
File: CASES

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Basic Patent (No,Kind,Date): US 6421464 BA 20020716    <No. of Patents: 001>
Patent Family:
    Patent No     Kind  Date       Applic No    Kind  Date
    US 6421464      BA  20020716    US 212210      A   19981216  (BASIC)
Priority Data (No,Kind,Date):
    US 212210 A  19981216

PATENT  FAMILY:
UNITED STATES OF AMERICA (US)
  Patent (No,Kind,Date):  US 6421464  BA  20020716
    FAST LAPPED IMAGE TRANSFORMS USING LIFTING STEPS (English)
    Patent Assignee:  FASTVDO LLC  (US)
    Author (Inventor):  TRAN TRAC D  (US); TOPIWALA PANKAJ  (US)
    Priority (No,Kind,Date):  US 212210  A   19981216
    Applic (No,Kind,Date):  US 212210  A   19981216
    National Class: *  382232000
    IPC: *  G06K-009/36
    Language of Document:  English

UNITED STATES OF AMERICA (US)
  Legal Status (No,Type,Date,Code,Text):
     US 6421464       P   19981216  US AE        APPLICATION DATA (PATENT)
                                    (APPL. DATA (PATENT))
                                    US 212210  A   19981216
     US 6421464       P   20020716  US BA        PATENT (NO PREVIOUS
                                    PRE-GRANT PUBLICATION)
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